

BASIS FOR THE AMENDMENT

Claim 15 has been amended as supported by Claims 24 and 25. Claim 18 has been amended as supported at page 19, line 7 of the specification. New Claim 27 has been added as supported by Claim 25 as originally filed.

No new matter is believed to have been added by entry of this amendment. Entry and favorable reconsideration are respectfully requested.

Upon entry of this amendment Claims 15, 17-18, 20, 23, 26, 27 will now be active in this application.

REMARKS

Applicants respectfully request reconsideration of the application, as amended, in view of the following remarks.

Amended Claim 15 relates to a method for producing a recycled resin, comprising:
adding and stirring, in an extruder, a decomposing agent to an urethane resin to cleave urethane bonds in said urethane resin and capture amino groups generated by the cleaving of said urethane bonds, **at a temperature between 150 to 280 °C**, thereby obtaining a decomposed substance of said urethane resin; and

reacting the decomposed substance of the urethane resin with a compound that contains at least one functional group selected from the group consisting of an epoxy group and an isocyanate group;

wherein said decomposing agent is an anhydride of a polycarboxylic acid;

adding the same or another decomposing agent to the resulting decomposed substance of said urethane resin, and reacting same or another decomposing agent with an aromatic diamine that was generated by said cleaving of said urethane bonds but was not captured, thereby reducing an amount of amine in the decomposed substance of the urethane resin; and

wherein the reaction of the same or another decomposing agent with said aromatic diamine is carried out at a temperature of 200°C or below.

Amended Claim 18 relates to a recycled resin, which is produced by
adding, in an extruder, a decomposing agent to an urethane resin to cleave urethane bonds in said urethane resin and capture amino groups generated by the cleaving of said

urethane bonds, at a temperature between 150 to 280 °C, thereby obtaining a decomposed substance of said urethane resin; and

then reacting the decomposed substance of the urethane resin with a compound that contains at least one functional group selected from the group consisting of an epoxy group and an isocyanate group;

wherein said decomposing agent is an anhydride of a polycarboxylic acid.

As claimed in **Claims 15 and 18 (and dependent Claims 17 and 20, notably dependent claims incorporate the subject matter of the independent claim)**, in a extruder, a decomposing agent is added to an urethane resin **and stirred** at temperatures between 150° and 280°C. As disclosed in Examples in the specification of the application, the generation of amino compound is effectively controlled by the above-mentioned temperature condition. In other words, the amine groups are reduced. See page 19, lines 4-19 of the specification:

While the degradation of urethane resin may be carried out at any suitable temperature, it is preferably carried out at a temperature in the range of 80 to 300°C., and more preferably in the range of 150 to 280°C., in order to improve efficiency. When the decomposing agent is provided in the form of solid, the degradation is preferably carried out at a temperature higher than or equal to the melting point of the decomposing agent. The resin may undergo unfavorable thermal decomposition at temperatures higher than 300°C., whereas it takes a substantial amount of time for the resin to decompose at temperatures lower than 80°C.

In the manner described above, the amount of amines in the decomposed substance of urethane resin can be reduced to some extent without a special amine-processing step.

In contrast, DE 19512778 does not mention that a decomposing agent is added to an urethane resin **and stirred** at temperatures between 150° and 280°C.

In addition, regarding **Claims 15, 26 and 27**, DE 19512778 does not disclose or suggest adding the same or another decomposing agent to the resulting decomposed

substance of said urethane resin, and reacting same or another decomposing agent with an aromatic diamine that was generated by said cleaving of said urethane bonds but was not captured, thereby reducing an amount of amine in the decomposed substance of the urethane resin.

Moreover, DE '778 does not disclose or suggest that the reaction of the same or another decomposing agent with said aromatic diamine is carried out at a temperature of 200°C or below/ or 150°C or below. See Claims 15 and 26, 27.

The specification discloses in the paragraph bridging pages 19 and 20:

However, when it is desired to further reduce the amount of amines, the decomposing agent can again be added to the resulting decomposed substance. In this way, the decomposing agent reacts with aromatic diamines that were not captured in the degradation step and further reduces their amounts. Preferably, this reaction is carried out at a temperature of 200°C. or below, and more preferably at a temperature of 150°C. or below although the reaction may be carried out at any suitable temperature. If the reaction temperature is too high, decomposition of urethane may further proceed and further aromatic amines may be generated.

This is not disclosed or suggested by DE '778. Therefore, the rejections over DE 19512778 should be withdrawn.

Regarding Claim 23, DE '778 does not disclose or suggest that the decomposing agent is crushed to 1 mm or less in size prior to use.

Regarding Claims 24, 26, 27, DE '778 does not disclose or suggest a method further comprising:

adding the same or another decomposing agent to the resulting decomposed substance of said urethane resin, and reacting same or another decomposing agent with an aromatic diamine that was generated by said cleaving of said urethane bonds but was not captured, thereby reducing an amount of amine in the decomposed substance of the urethane resin.

The specification discloses in the paragraph bridging pages 19 and 20:

However, when it is desired to further reduce the amount of amines, the decomposing agent can again be added to the resulting decomposed substance. In this way, the decomposing agent reacts with aromatic diamines that were not captured in the degradation step and further reduces their amounts. Preferably, this reaction is carried out at a temperature of 200°C. or below, and more preferably at a temperature of 150°C. or below although the reaction may be carried out at any suitable temperature. If the reaction temperature is too high, decomposition of urethane may further proceed and further aromatic amines may be generated.


This is not disclosed or suggested by DE '778. Therefore, the rejections over DE 19512778 should be withdrawn.

The rejection of Claims 15, 17, 18 and 20 under 35 U.S.C. 112, 2nd paragraph, is obviated by the amendment of Claims 15 and 18.

This application presents allowable subject matter, and the Examiner is kindly requested to pass it to issue. Should the Examiner have any questions regarding the claims or otherwise wish to discuss this case, he is kindly invited to contact Applicants' below-signed representative, who would be happy to provide any assistance deemed necessary in speeding this application to allowance.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.
Norman F. Oblon


Kirsten A. Gruneberg, Ph.D.
Registration No.: 47,297

Customer Number
22850
Fax: (703) 413 -2220
NFO:KAG: